which is good enough to hold it in the open to follow it into an open drain large enough for the dog to reach it." Other people who have hunted badgers have found that an extremely small terrier is quite able to turn a badger from its earth; and that although the dog may be hurt, even seriously, by its formidable antagonist, the contest does not by any means mean "certain death" to it.

The chapter on birds bears evidence of having been put together in the most casual manner. Various contributors have sent in notes as to whether, in their experience, birds were rare or not, and these appear to have been printed without any attempt at summarizing. The result is that the whinchat is described in one line as "common," and in the next as "occasionally seen." The marsh-tit is "rare," and also "generally distributed." The cirl bunting is in one line called "rare" and "by no means rare." The coot is "rare" (!) and "frequently met with." The woodcock, according to one observer, "has been seen." If it were clear that such remarks applied to different parts of the county, there might be some sense in printing them. As they stand, they are useless and bewildering. One contributor is surprised at the occurrence of the gannet just outside the limits of the county, because "they generally inhabit the Bass Rock"! They certainly do, and "there's milestones on the Dover road." But perhaps there is nothing in the whole chapter which quite comes up to what we read about two starlings that one of the contributors watched "fighting furiously . . . each bird . . . trying to force its bill into that of the other. *He was informed that the purpose of each bird was by this means to render the opponent insensible; so as to be more easily destroyed.*"

In the article on reptiles occur these remarkable words:—"The slowworm is habitually 'slow,' but we know of no reptile or quadruped which, in proportion to its size, can move more rapidly."

There are several errors in spelling in the list of land and fresh-water shells, and it is rather misleading to give "Downs, under stones," for the habitat of the species here called *Bacutus*, without adding "near the sea."

Helianthemum polifolium is given as a Gloucestershire plant. It would be interesting to know if this is correct. The localities usually given are in Somerset and Devon.

Among the illustrations are some interesting figures of famous trees; but it seems hardly worth while to have inserted such a very ordinary-looking plate as that of the common crayfish.

Allusion has already been made to two chapters the excellence of which is all the more marked by contrast with the grandiloquent flights and the trivial details of much of this unfortunate volume. Rev. W. F. White's paper on ants contains, as might be expected, accounts of many interesting and original observations. Mr. Vincent Perkins's excellent chapter on wasps and bees, again, is extremely good, though the writer deals only with the neighbourhood of Wotton-under-Edge. That so imperfect, and, as far as much of its contents goes, we are afraid we must say untrustworthy, a book should ever have been published is matter for regret. The real "Fauna and Flora of the County of Gloucester" yet remains to be written.

OUR BOOK SHELF.

The Chemistry of Life and Health. "University Extension Manuals." By C. W. Kimmins, M.A., D.Sc., Staff Lecturer in Chemistry, Cambridge University Extension Scheme. (London: Methuen and Co., 1892.)

THIS little book is well adapted to secure the aim of the author, which is "to give sufficient information on the particular portions of the sciences involved to enable readers . . . . to appreciate fully the fundamental principles of hygiene." There can be no doubt of the importance, one might truly say, the national importance, of the spread of sound knowledge regarding the laws of health. Such sound knowledge cannot be attained except it be built upon a well-laid foundation of chemistry and physiology. To lay the foundation, and rear the structure, in a little book of 160 pages is almost impossible. Dr. Kimmins has, wisely, omitted much; but what he retains is of fundamental importance; his facts are clearly enunciated and systematically arranged. A careful study of this book, especially when it is supplemented, as it is meant to be, by a course of lectures, cannot fail to be most useful. The book is written for ordinary people, not for professional students; the teaching is sound and clear. The first chapter, on the principles of chemistry, is the least satisfactory in the book; but in this chapter the author has attempted, what is surely unattainable, to give an elementary knowledge of the features of chemical action, the use of chemical symbols, and the molecular and atomic theory, in sixteen small pages. As an introduction to the study of the application of chemical facts and principles to the conditions of healthy life, the book is to be thoroughly recommended.

Naked-Eye Botany, with Illustrations and Floral Problems. By F. E. Kitchener, M.A. Pp. 182 and fifty-two woodcuts in the text. (London: Percival and Co., 1892.)

ON turning over the pages of this book one wonders why "Naked-Eye Botany" was chosen for the title, because, although a small book, it has some reference at least to a great many things that cannot be seen with the naked eye. It is something in the way of Prof. D. Oliver's "Lessons in Elementary Botany," but one misses the Professor in it. On p. 7 we are introduced to stomata, and physiological processes are described in some detail. Nevertheless it contains much useful matter, and with a little revision and better selections would make a very good first book. For example, the chickweed is chosen for the first lesson. But the flowers of this plant are so small and the number of parts in the various floral whorls is so variable that it is not a good subject to begin with. The "problems," or questions, also at the end of each chapter are too wide-reaching. Referring to *Aspidium Filix-mas*, we are told that the "production of the fertilized seed, more correctly called oosphere, from the prothallus, can scarcely be made out with the naked eye." Saying nothing about the name given to the fertilized body, we must protest that "scarcely" is not the word to qualify the observation.

Perhaps it is too much to ask that the headmaster of a "high school" should be acquainted with even remotely recent discoveries in physiological botany; but it would not be unreasonable to ask him to use the text-books of specialists. It is now some years since the reproduction of *Lycopodium* was fully described, yet Mr. Kitchener still teaches that the spores are of two sorts.

The Great World's Farm: some account of Nature's Crops and how they are Grown. By Selina Gaye. (London: Seeley, 1893.)

THIS is a delightful book, pleasantly written, full of information, and on the whole remarkably free from those errors, generally the results of misunderstanding, which

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are the sins that do so easily beset writers on popular science. The volume, which contains some excellent illustrations, deals with "pioneer labourers," "soil-makers," "soil-carriers," "soil-binders," "field-labourers," "guests welcome and unwelcome," "nature's militia," and so forth. We do not propose to tell who or what the labourers, the guests, or the militia are. We advise those of our readers who are interested in the transactions of the Great World's Farm to get the volume and ascertain for themselves.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Measurement of Distances of Binary Stars.

SOME years ago I communicated to a few astronomers a plan for measuring the distance which separates us from some of the binary stars, believing, as I did, that by using the diameters of their paths as a basis, determinations of distance could be made which are impossible with the means at present in use.

This basis could, I hoped, be calculated by first ascertaining the velocities with which the stars are moving in their paths, in a somewhat similar manner to that employed for measuring the motions of stars with the spectroscope, except that instead of making a comparison with a hydrogen flame, the spectra of the two stars should be compared by photographing them together. The width of any double lines, which may show themselves (the one line belonging to the spectrum of the receding star, and the other to the advancing one) would be a measure of their velocities expressed in miles. Applying this information to the known period of revolution of the system, its diameter can also be expressed in miles, and this would enable one to estimate the distance from the earth if the angle between the two stars were known. This suggestion has already borne fruit, the relative velocity of some rapid, but as yet inseparable, binaries having recently been determined.

The answers received to my suggestions were discouraging, but since then instruments have been improved, and I trust that you will think the matter of sufficient importance to be brought before the notice of your numerous astronomical readers. Should any of them be able to make the necessary determination, a foundation-stone will have been laid, not only for obtaining a true idea of perhaps undreamt of stellar distances, but also of the masses of binary stars, and possibly a connection may ultimately be traced between them and the adjoining ones.

The two most brilliant binary stars are α Centauri and α Geminorum, and as in both these cases the paths are elongated ellipses, and the stars near their extremities, efforts should be directed towards determining their distances as suggested above. C. E. STROMEYER.

Strawberry Hill, November 16.

Remarkable Weapons of Defence.

THE following extract from a letter from such a careful observer as Mr. E. E. Green is of such general and special interest as to require publication.

Mr. R. J. Pocock informs me that the Acaroid is almost certainly *Holothyrus coccinella*, Gerv., a species that appears to be common in Mauritius, and that in the lateral membranous area between the carapace and the cephalothoracic limbs is a distinct orifice which was regarded by Dr. Thorell as of respiratory import, but in connection with Mr. Green's interesting discovery of the existence of offensive glands in this animal it is necessary to bear in mind the possibility of its being the outlet of these organs.

The mite has such a hard integument, that being taken into the mouths of the lizards and birds that would probably prey upon it in the situations it frequents, would probably do it little or no damage if it were speedily rejected. G. F. HAMPSON.

THE accompanying insects—apparently Orobatid mites—were found by me in the district of Tallawakelle, Ceylon (alt. 4600 ft.), under stones and rocks in damp, shady situations. It was only by accident that I became aware of their remarkable weapons of defence—an exceedingly pungent secretion.

About five hours after handling one of these insects I accidentally touched my tongue with my finger. Immediately an extraordinarily pungent, galvanic sensation or taste commenced rapidly to spread over my mouth, quickly reaching my throat. Rinsing my mouth and gargling with hot water failed to arrest the progress of the sensation, which was accompanied with excessive salivation. The unpleasantness lasted for several hours, and then died away without any further consequences. I also unconsciously rubbed my face, at the angle of the eye, with the same finger; after which a rather pleasant warmth spread over that part of my face, and was distinctly perceptible the following morning.

I could not for some time trace the cause of this effect. I at first put it down to the agency of a fungus that I had been carrying, but a further experiment negatived this idea. I afterwards tested the insect, and found it to be the real agent. The experiment was repeated at my suggestion, by a medical friend—Dr. R. J. Drummond—who can testify to the result. He described the sensation as somewhat like that produced by the strongest menthol. We both noticed that it had a numbing effect upon the mucous membrane of the mouth.

It is evident that this property must be a very efficient protection to the insect. The rapidity with which the secretion acts would cause it to be very quickly ejected if picked up by either a bird or a lizard—the only enemies that would be likely to attack it. E. ERNEST GREEN.

Eton, Pundulorja, November.

A Suggestion.

As very shortly now NATURE will reach its jubilee volume, I hope you will permit me, as an uninterrupted subscriber for nearly twenty years, to offer a suggestion with regard to that occasion.

As the volumes of NATURE contain original contributions, observations, and notes in all branches of science, more varied and valuable than are to be found in any other scientific periodical publication in existence, there is not a worker, in whatever branch he may be engaged, that does not find it necessary to be continually referring to its pages; but, unfortunately, through lack of a general handy index, he discovers what he wants only after the expenditure of a very great deal of time and worry.

I write, therefore, not only in my own name, but (by request in a private way) in that of a large number of fellow-workers in the subjects in which I am myself specially interested—biology, palæontology, anthropology, geography—to suggest that you should celebrate the jubilee of NATURE by conferring on your readers the immense boon of a classified index to its contents.

During some investigations I was making in 1876-7 I so felt the need of a collected index that I went to the trouble of compiling for myself one, up to that date, classified according to sciences, subdivided again according to the sections of each, which in subsequent work saved me weeks of time and trouble. To my regret, this MS. got lost or destroyed, and there is nothing in connection with NATURE that I, and I am certain every other worker, would now hail with greater satisfaction than the announcement that the means of reaching with expedition and precision the treasures at present so deeply buried in your (nearly) fifty priceless volumes, will be ced within our reach with its jubilee volume. OLD SUBSCRIBER.

Superstitions of the Shuswaps of British Columbia.

REFERRING to the above, as recorded by Dr. George Dawson, F.R.S., in the Transactions of the Royal Society of Canada, and included in your Notes of last issue, in which attention is called to the belief among the Shuswaps and some other North American races, that small lizards enter the bodies of men, pursuing them, and devouring their hearts, I was at once struck with the almost exact resemblance of this belief to one very generally prevailing in Ireland, as regards common water Newts, which go by the name of Man-eaters (pronounced Man-aters). This I can testify to from personal knowledge; but it has been accidentally confirmed by an experiment which I hope I may be pardoned for referring to. Where I reside are three Irish servants, to whom I caused to be shown a drawing of the Water Newt, and with the request that I might be told its

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